# TS256MSQ64V5N

**200PIN DDR2 533 SO-DIMM**
**2GB With 256Mx8 CL4**

## Description

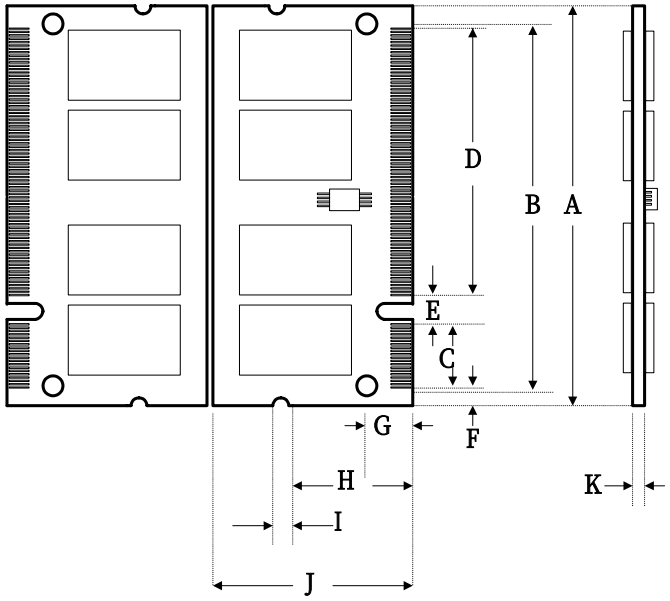
The TS256MSQ64V5N is a 256M x 64bits DDR2-533 SO-DIMM. The TS256MSQ64V5N consists of 8pcs 256Mx8 bits DDR2 SDRAMs in 68 ball FBGA packages and a 2048 bits serial EEPROM on a 200-pin printed circuit board. The TS256MSQ64V5N is a Dual In-Line Memory Module and is intended for mounting into 200-pin edge connector sockets.

Synchronous design allows precise cycle control with the use of system clock. Data I/O transactions are possible on both edges of DQS. Range of operation frequencies, programmable latencies allow the same device to be useful for a variety of high bandwidth, high performance memory system applications.

## Features

- RoHS compliant products.
- JEDEC standard 1.8V ± 0.1V Power supply
- VDDQ=1.8V ± 0.1V
- Max clock Freq: 267MHZ; 533Mb/s/Pin.
- Posted CAS
- Programmable CAS Latency: 3,4,5
- Programmable Additive Latency :0, 1,2,3 and 4
- Write Latency (WL) = Read Latency (RL)-1
- Burst Length: 4,8(Interleave/nibble sequential)
- Programmable sequential / Interleave Burst Mode
- Bi-directional Differential Data-Strobe (Single-ended data-strobe is an optional feature)
- Off-Chip Driver (OCD) Impedance Adjustment
- MRS cycle with address key programs.
- On Die Termination
- Serial presence detect with EEPROM

## Placement



## Dimensions

| Side | Millimeters | Inches |
|---|---|---|
| A | 67.6±0.15 | 2.661±0.006 |
| B | 63.6 | 2.503 |
| C | 11.4 | 0.449 |
| D | 47.4 | 1.866 |
| E | 4.2 | 0.165 |
| F | 2.15±0.15 | 0.085±0.006 |
| G | 6 | 0.236 |
| H | 18 | 0.709 |
| I | 4 | 0.157 |
| J | 30 | 1.181 |
| K | 1.0±0.075 | 0.039±0.003 |

**(Refer Placement)**

## Pin Identification

| Symbol | Function |
|---|---|
| A0~A15, BA0~BA2 | Address input |
| DQ0~DQ63 | Data Input / Output. |
| DQS0~DQS7 | Data strobe |
| /DQS0~/DQS7 | Differential Data strobe |
| CK0, /CK0<br>CK1, /CK1 | Clock Input. |
| CKE0, CKE1 | Clock Enable Input. |
| ODT0, ODT1 | On-die termination control line |
| /CS0, /CS1 | Chip Select Input. |
| /RAS | Row Address Strobe |
| /CAS | Column Address Strobe |
| /WE | Write Enable |
| DM0~DM7 | Data-in Mask |
| VDD | +1.8 Voltage power supply |
| VDDQ | +1.8 Voltage Power Supply for DQS |
| VREF | Power Supply for Reference |
| VDDSPD | Serial EEPROM Positive Power Supply |
| SA0~SA2 | Address select for EEPROM |
| SCL | Serial PD Clock |
| SDA | Serial PD Add/Data input/output |
| VSS | Ground |
| NC | No Connection |

**Pinouts:**

| Pin No | Pin Name | Pin No | Pin Name | Pin No | Pin Name | Pin No | Pin Name | Pin No | Pin Name | Pin No | Pin Name |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | VREF | 69 | NC | 137 | DQ35 | 02 | VSS | 70 | DQS3 | 138 | VSS |
| 03 | VSS | 71 | VSS | 139 | VSS | 04 | DQ4 | 72 | VSS | 140 | DQ44 |
| 05 | DQ0 | 73 | DQ26 | 141 | DQ40 | 06 | DQ5 | 74 | DQ30 | 142 | DQ45 |
| 07 | DQ1 | 75 | DQ27 | 143 | DQ41 | 08 | VSS | 76 | DQ31 | 144 | VSS |
| 09 | VSS | 77 | VSS | 145 | VSS | 10 | DM0 | 78 | VSS | 146 | /DQS5 |
| 11 | /DQS0 | 79 | CKE0 | 147 | DM5 | 12 | VSS | 80 | *CKE1 | 148 | DQS5 |
| 13 | DQS0 | 81 | VDD | 149 | VSS | 14 | DQ6 | 82 | VDD | 150 | VSS |
| 15 | VSS | 83 | */CS2 | 151 | DQ42 | 16 | DQ7 | 84 | *A15 | 152 | DQ46 |
| 17 | DQ2 | 85 | *BA2 | 153 | DQ43 | 18 | VSS | 86 | *A14 | 154 | DQ47 |
| 19 | DQ3 | 87 | VDD | 155 | VSS | 20 | DQ12 | 88 | VDD | 156 | VSS |
| 21 | VSS | 89 | A12 | 157 | DQ48 | 22 | DQ13 | 90 | A11 | 158 | DQ52 |
| 23 | DQ8 | 91 | A9 | 159 | DQ49 | 24 | VSS | 92 | A7 | 160 | DQ53 |
| 25 | DQ9 | 93 | A8 | 161 | VSS | 26 | DM1 | 94 | A6 | 162 | VSS |
| 27 | VSS | 95 | VDD | 163 | NC, TEST | 28 | VSS | 96 | VDD | 164 | CK1 |
| 29 | /DQS1 | 97 | A5 | 165 | VSS | 30 | CK0 | 98 | A4 | 166 | /CK1 |
| 31 | DQS1 | 99 | A3 | 167 | /DQS6 | 32 | /CK0 | 100 | A2 | 168 | VSS |
| 33 | VSS | 101 | A1 | 169 | DQS6 | 34 | VSS | 102 | A0 | 170 | DM6 |
| 35 | DQ10 | 103 | VDD | 171 | VSS | 36 | DQ14 | 104 | VDD | 172 | VSS |
| 37 | DQ11 | 105 | A10/AP | 173 | DQ50 | 38 | DQ15 | 106 | BA1 | 174 | DQ54 |
| 39 | VSS | 107 | BA0 | 175 | DQ51 | 40 | VSS | 108 | /RAS | 176 | DQ55 |
| 41 | VSS | 109 | /WE | 177 | VSS | 42 | VSS | 110 | /CS0 | 178 | VSS |
| 43 | DQ16 | 111 | VDD | 179 | DQ56 | 44 | DQ20 | 112 | VDD | 180 | DQ60 |
| 45 | DQ17 | 113 | /CAS | 181 | DQ57 | 46 | DQ21 | 114 | ODT0 | 182 | DQ61 |
| 47 | VSS | 115 | */CS1 | 183 | VSS | 48 | VSS | 116 | *A13 | 184 | VSS |
| 49 | /DQS2 | 117 | VDD | 185 | DM7 | 50 | NC | 118 | VDD | 186 | /DQS7 |
| 51 | DQS2 | 119 | *ODT1 | 187 | VSS | 52 | DM2 | 120 | */CS3 | 188 | DQS7 |
| 53 | VSS | 121 | VSS | 189 | DQ58 | 54 | VSS | 122 | VSS | 190 | VSS |
| 55 | DQ18 | 123 | DQ32 | 191 | DQ59 | 56 | DQ22 | 124 | DQ36 | 192 | DQ62 |
| 57 | DQ19 | 125 | DQ33 | 193 | VSS | 58 | DQ23 | 126 | DQ37 | 194 | DQ63 |
| 59 | VSS | 127 | VSS | 195 | SDA | 60 | VSS | 128 | VSS | 196 | VSS |
| 61 | DQ24 | 129 | /DQS4 | 197 | SCL | 62 | DQ28 | 130 | DM4 | 198 | SA0 |
| 63 | DQ25 | 131 | DQS4 | 199 | VDDSPD | 64 | DQ29 | 132 | VSS | 200 | SA1 |
| 65 | VSS | 133 | VSS | | | 66 | VSS | 134 | DQ38 | | |
| 67 | DM3 | 135 | DQ34 | | | 68 | /DQS3 | 136 | DQ39 | | |